

IN THE CLAIMS:

1. (Previously Presented) A black hexavalent chromium-free plating treatment method which is designed so that the corrosion resistance of a surface of a metal is improved, comprising the steps of:

plating the surface of the metal part as a base with zinc in a zinc plating treatment step;

activating a surface of the zinc-plated coating in a treatment solution in a dilute nitric acid activation treatment step;

rinsing the activated metal part to remove nitric acid components;

subsequently forming a black coating on the rinsed metal part in an inorganic salt solution containing trivalent chromium and iron components as main ingredients in a black chromate treatment step;

rerinsing the black coated metal part;

then subjecting the rerinsed metal part to a finish treatment by forming a transparent conversion coating on the rerinsed metal part in a solution of inorganic salt and organic acid containing trivalent chromium and silica as main ingredients in a finish treatment step; and

drying the finished metal part in a drying step.

2. (Previously Presented) A black hexavalent chromium-free plating treatment method which is designed so that the corrosion resistance of a surface metal of a metal part is improved comprising the steps of:

plating the surface of the metal part as a base with zinc in a zinc plating treatment step;

activating a surface of the zinc-plated coating in a treatment solution in a dilute nitric acid activation treatment step;

then rinsing the activated metal part to remove nitric acid components;

forming a black regulation coating on the rinsed metal part in solution of inorganic salt and organic acid containing trivalent chromium and silica as main ingredients in a conversion treatment step which is arranged next to the rinsing step;

rinsing the coated metal part;

subsequently forming a black coating on the rinsed coated metal part in an inorganic salt solution containing trivalent chromium and iron components as main ingredients in a black chromate treatment step;

rerinsing the black coated metal part;

subjecting the rerinsed metal part to a finish treatment in a finish treatment step by forming a transparent conversion coating on the rerinsed metal part in a solution of inorganic salt and organic acid which contains trivalent chromium and silica as main ingredients and is less concentrated than the solution used in the foregoing conversion treatment step; and

drying the finished metal part in a drying step.

3. (Previously Presented) The black hexavalent chromium-free plating treatment system according to claim 1 or 2 wherein the finish treatment step comprises an initial finish treatment step in which a transparent conversion coating is formed in a solution of inorganic salt and organic acid which contains trivalent chromium and silica as main ingredients and a final finish treatment step in which after rinsing following the initial finish treatment, the rinsed metal part is immersed in any one of a overcoat treatment solution containing silica and cobalt as main ingredients and a water-soluble anti-corrosive solution.

4. (Previously Presented) A method of treating a zinc surface to improve corrosion resistance and provide a black color, the method comprising the steps of:

activating the zinc surface by immersion in a nitric acid solution;

treating the zinc surface with an inorganic salt solution having trivalent chromium and iron components forming a black chromate coating; and

treating the black chromate surface with an inorganic salt and organic acid solution having trivalent chromium and silica to form a transparent chromate coating layer thereon.

5. (Previously Presented) The method of treating a zinc surface in Claim 4 further comprising removing the nitric acid solution after activation and before treating with an inorganic salt solution having trivalent chromium and iron components.

6. (Previously Presented) The method of treating a zinc surface in Claim 5 further comprising rinsing the black chromate coating with water before treating the black chromate surface.

7. (Previously Presented) A method of treating a zinc surface to improve corrosion resistance and provide black color, the method comprising the steps of:

activating the zinc surface by immersion in a nitric acid solution;

treating the zinc surface with an inorganic salt and organic acid solution having trivalent chromium and silica forming a first chromate coating;

treating the chromate surface with an inorganic salt solution having trivalent chromium and iron components forming a black chromate coating; and

treating the black chromate surface with an inorganic salt and organic acid solution having trivalent chromium and silica to form a second chromate coating, wherein the second chromate coating is transparent.